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first, that Herbart's psychological standpoint is the only intelligible and workable standpoint for the practical teacher; and, second, that from this standpoint such definite connotations can be given to the terms soul or mind, knowing, feeling, will, interest, and habit, that the terms so connoted become scientific and guiding concepts for educational practice."

The author first discusses some of the critics of Herbart, dissenting from those who, from the Kantian point of view, regard the theoretical foundations of Herbart's pedagogy as thoroughly unstable, and from the position taken by Dr. Hayward and other Herbartians, who, while admitting the incompleteness or even erroneousness of Herbart's metaphysics and psychology, maintain that this in no way militates against the practical value of his educational doctrines, which were not deduced from his philosophy. Dr. Davidson, on the contrary, maintains that if the Herbartian theory of education works in practice, it implies a sound psychological theory and that the logical procedure is to question whether Herbart has been rightly interpreted, rather than to assume a contradiction between theory and fact. He finds the key to Herbart in the philosophy of Leibniz and through this offers a new interpretation of Herbart. In order to make the relation clear, he devotes three chapters to the Leibnizian philosophy, discussing successively Leibniz's philosophical principles, his psychological standpoint, and his theory of feeling and will. He then proceeds to discuss Herbart's psychological standpoint in comparison with that of Leibniz, beginning with his definition of soul and taking up point by point the similarities and differences of the two systems and showing that the latter are more in seeming than in reality. He then discusses in a similar way, Herbart's theory of presentation, theory of feeling, theory of will, and concept of interest, summarizing the main points of his argument as follows: "Soul life is life in and through presentations and knowledge. Will is the movement of presentations or knowledge, and meaningless when regarded as separable from knowledge. Hence right knowledge *in movement* will imply right willing. But the soul life can be habituated to move in right presentations or knowledge by the educative instruction of the educator, which secures that the right presentations are sufficiently often repeated in the soul-life to become habituated soul activities. The conception of the 'Memory of Will' is adopted by Herbart to account for the growth of this habituated soul activity. The various habituated activities ultimately form the soul-life into an organized instrument—an organon called interest—which wills, in the truest and highest sense of willing, the moral life of thought and action." Then follow chapters on the fallacy of formal education, individuality, and many sided interest, and interest versus self-realization as the first principle of education. The book is throughout clearly and logically written and is a valuable contribution to the philosophy of education.

THEODATE L. SMITH.

*The Origin of Life*, by J. BUTLER BURKE. Chapman & Hall, London, 1906. pp. 351.

In *Nature*, May 25th, 1905, Mr. Burke published a short account of experiments carried on by him in the Cavendish Laboratory at Cambridge, which evoked great interest and much discussion. A somewhat more elaborate account appeared in the September number of the *Fortnightly Review*. These experiments dealt with certain forms of radio-activity, and in the course of them Mr. Burke discovered certain minute bodies, which he named radiobes, and which he claimed exhibited certain characteristics of living matter. He characterizes

them as follows: Radiobes are "neither crystalline nor colloids in disguise, though colloids in the aggregate, but something more, and crystals in their constituent parts." They differ from both in "possessing the elements of vitality in a primitive and undeveloped state." The widespread interest in these experiments, now elaborated in book form, was due to the fact that they dealt with the question of spontaneous generation in a new form. Not that Mr. Burke is the only investigator at work on this problem, as Raphael Dubois, M. Benedict and Renaudet have all published researches along this line, but Mr. Burke's book is the first extensive English publication dealing with this phase of the subject whose problem is not of known organisms, but of the character of hitherto unknown bodies which some experimenters, among whom is Mr. Burke, are inclined to consider as living, while others regard them merely as peculiar crystals, having possibly traces of organic impurities mingled with them. The production and behavior of Mr. Burke's radiobes is, briefly stated, as follows: When sodium bromide is allowed to drop upon beef gelatine contained in a sterilized tube, by means of a small inner tube which can be broken without opening the test tube, after an interval of about twenty-four hours, minute bodies appear. These bodies, according to Mr. Burke, develop a nucleus, grow, and after reaching a certain size, subdivide. This subdivision constitutes their strongest claim to life and is denominated by Mr. Burke as "reproduction of a degenerative sort," since the cycle is not continued when subcultures are made. But strangely enough, in view of its fundamental importance for Mr. Burke's theory, he nowhere hints at having subjected these bodies to continuous observation which, however tedious and wearisome, would be a necessity for scientific thoroughness and accuracy, nor does he claim even to have seen the actual process of division. The statement that they do divide is apparently an inference from successive appearances under the microscope, but how easily juxtaposition may be mistaken for fission is a matter well known to microscopists. An excellent example of these appearances may be found in Rainey's figures, reproduced in Bastian's *Beginnings of Life*. But admitting that fission did occur, it is not shown in what specific ways it differs from the fission observed in experiments with fatty matters derived from dead animal substance. Moreover, radiobes are soluble in warm water, a fact difficult to reconcile with any generally accepted theory of conditions under which life first appeared. A. L. Herrera, in the *Revue Scientifique* of Feb. 17, 1906, thus expresses his opinion as to the nature of these bodies. "As far as Burke's radiobes are concerned, they would appear to be simply accidental crystals of carbonates of barium and calcium, swelling in organic liquids or media. . . . These crystals, which have been studied conscientiously by Harting and Rainey, are attackable by weak acids, which have an albuminoid or fatty nucleus."

As a whole Mr. Burke's book bears the marks of having been hastily thrown together. The few references are so incomplete and inaccurate as to be practically worthless, and important theories and experiments are quoted with no clue as to their date or place of publication. The chapters in which Mr. Burke records his own experiments, where, if nowhere else, the reader has a right to expect accuracy and clearness of statement, leave one with a good deal of uncertainty as to the methods of observation and actual progress of the experiments, and an error in the numbering of the plates makes the references to the various appearances which they are supposed to illustrate, unintelligible. It is to be regretted that the publication of this book was not deferred until it could be completed in a more accurate and scientific form.

THEODATE L. SMITH.